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(71) Applicant: RIVERWOOD INTERNATIONAL
CORPORATION
Atlanta, Georgia 30339 (US)

(72) Inventor: Müller, Rolf
D-54346 Mehring (DE)

(74) Representative: Marles, Alan David
Stevens, Hewlett & Perkins
1 St Augustine's Place
Bristol BS1 4UD (GB)

(54) Article spacing conveyor mechanism

(57) There is provided an article conveyor mechanism comprising a drive chain 13 on which is pivotally mounted a number of carriages 16 each having a conveyor 17 secured thereto. Each conveyor 17 has a plurality of pockets 18. Each conveyor 16 has two pins 19, 20 for engaging in respective grooves 21, 22 which are identical to each other in shape, but which are offset. When the chain 13 is driven, the conveyors remain parallel to each other throughout their endless paths.

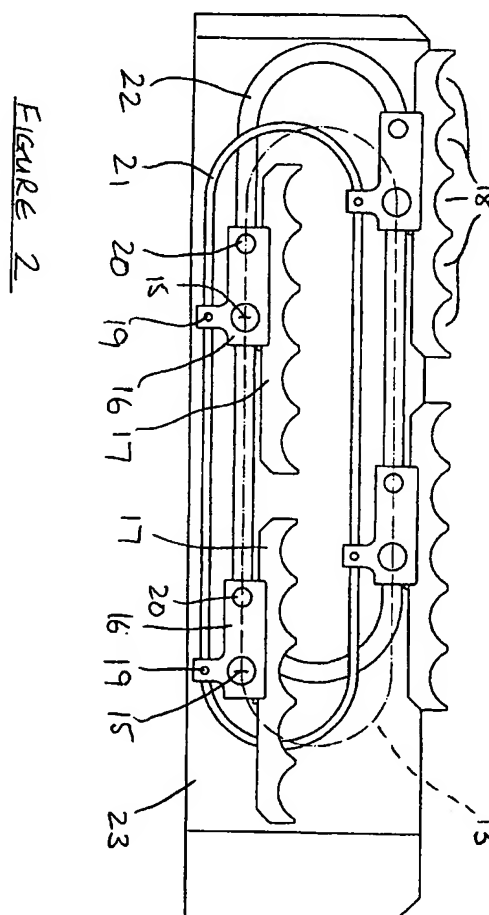


Figure 2

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Description

This invention relates to spacing conveyor mechanisms for article packaging machines and in particular but not exclusively for can or bottle multi-pack packaging machines.

According to a first aspect of the present invention there is provided a spacing conveyor mechanism for an article packaging machine having an article feed path, said mechanism comprising a number of article conveyors mounted on an endless drive for movement in a circuitous path a part of which is in use adjacent the feed path of the articles and during which part of its path each conveyor engages articles in the feed path, each conveyor comprising a carriage pivotally attached to the endless drive and an article engaging member attached to the carriage, each carriage having two or more followers each for cooperation with a guide means, the two or more guide means being of the same shape to each other but offset such that the carriages remain substantially parallel to each other throughout their circuitous paths.

Preferably said path of the conveyor adjacent the feed path is substantially straight. Conveniently two of said guide means are provided in the form of tracks each having two straight sections joined by semi circular ends, one of said straight sections effecting the movement of the conveyors adjacent the feed path.

In some embodiments each article engaging member has a number of recessed pockets each for an article and also each article engaging member is removably attached to its associated carriage. In further preferred embodiments the carriages are pivotally attachable at any location along the length of the drive which is preferably a chain. In normal embodiments the carriages are equispaced along the length of the chain.

Preferably the guide tracks are offset such that the straight sections are offset in both lateral and lengthwise directions. In certain embodiments the guide tracks are formed as grooves in a plastics member disposed above the single chain. Also, the guide tracks are superimposed on each other and cross each other at two locations.

According to a second aspect of the present invention there is provided a spacing conveyor arrangement comprising two such spacing conveyor mechanisms located parallel to each other on either side of adjacent article feed paths, each set of article conveyors engaging separate lines of articles.

An embodiment of the present invention will now be described in more detail. The description makes reference to the accompanying drawings in which:

Figure 1 is a schematic view from above of a spacing conveyor mechanism according to the invention, excluding a cover member.

Figure 2 is a schematic view from below of part of the spacing conveyor mechanism shown in Figure

1, and

Figure 3 is a schematic section through the mechanism on line III-III of figure 1.

In the figures there is shown a spacing conveyor mechanism 10 for a packaging machine. The embodiment shown is for spacing and conveying multiples of cans or bottles. The mechanism 10 is, in use, positioned adjacent a feed path 11 defined by a moving belt, for example, which conveys the cans or bottles in groups to an area (not shown) where they are automatically packed into boxes, sleeves etc. A feed mechanism 12 which may be in the form of a star wheel arrangement feeds cans or bottles to the mechanism 10 at a rate equal to the rate required. The mechanism groups the cans or bottles on to a conveyor means, such as the moving belt, which transports the groups to the packing section of the packaging machine. Quite frequently a similar mechanism 10 will be provided in parallel so as to space and convey articles in one or two rows, the moving belt having space for said row or rows of articles to pass between the two mechanisms 10.

Each mechanism 10 comprises a drive chain 13 which is positioned in a horizontal plane between two sprockets 14. Pivotally connected to the chain at equally spaced locations 15 are carriages 16 each carrying a conveyor 17. The conveyors have a number of recessed pockets 18 for receiving a chosen number of individual bottles or cans which number of course determines the sizes of the multipacks being produced.

In the embodiment shown there are five pockets 18 in each of four conveyors 17 so that for every full revolution of the chain 13, twenty cans will be moved to the packing area in groups of five. Similarly the star wheel 12 will feed twenty cans to the mechanism 10 in the same time period. The drives of the star wheel and the chain 13 can be the same or separate drives could be used as long as they are controlled so as to work on the same number of cans in a given time period.

To ensure smooth movement of the cans through the mechanism 10, it is important that the conveyors 17 approach and separate from the cans substantially parallel to the feed path 11. The conveyors 17 and carriages 16 are, therefore, kept parallel to each other all the time and in particular as they approach the cans and separate from the cans.

In order to keep the carriages 16 and thus the conveyors 17 parallel, each carriage is provided with two upwardly projecting, spaced pins 19, 20. The pins 19, 20 are spaced from the pivotal connection 15 of the carriage 16 and the chain 13 and the pins 19, 20 are not in straight alignment with the connection 15. Each pin 19, 20 engages in its own guide track 21, 22 formed in a plastics cover member 23 located above the chain 13. The two guide tracks 21, 22 are of identical shape and length and are offset by the same amount and in the same directions as are the two pins 19, 20 on from another. As the carriages 16 are driven in their circuitous

path by the chain 13 the carriages 16 and conveyors 17 remain parallel to each other throughout, by virtue of the identical placement of the pins 19, 20 on the carriages, the identical offset guide tracks and the pivotal connections of the carriages on the chain. One set of pins 20 are larger in diameter than the other set of pins 19 and therefore the width of guide track 22 is greater than that of guide track 21. The pins 19, 20 could, however, be of identical size or reversed.

It will be apparent that other arrangements are of course possible. For example the chain could be replaced by other endless drive means or it may follow a more complex path than that shown. The pitch of the mechanism could be changed by providing more or less carriages/conveyors and the conveyors could be changed so as to provide pockets for any number of cans/bottles. Changes in the relative speeds of the star wheel and the chain may however be required.

The pin arrangement shown has been found to be particularly suitable, but others are possible. The guide tracks could even be offset only in the lengthwise or lateral directions if desired provided the pin placements reflected such changes. Further guide tracks/pins could be provided, but may cause difficulties in operating the mechanism as smoothly as desired.

Claims

1. A spacing conveyor mechanism for an article packaging machine having an article feed path, said mechanism comprising a number of article conveyors mounted on an endless drive for movement in a circuitous path a part of which is in use adjacent the feed path of the articles and during which part of its path each conveyor engages articles in the feed path, each conveyor comprising a carriage pivotally attached to the endless drive and an article engaging member attached to the carriage, each carriage having two or more followers each for cooperation with a guide means, the two or more guide means being of the same shape to each other but offset such that the carriages remain substantially parallel to each other throughout their circuitous paths.
2. A mechanism as claimed in claim 1 wherein said path of the conveyor adjacent the feed path is substantially straight.
3. A mechanism as claimed in claim 2 wherein two of said guide means are provided in the form of tracks each having two straight sections joined by semi circular ends, one of said straight sections effecting the movement of the conveyors adjacent the feed path.
4. A mechanism as claimed in any one of claims 1 to

3 wherein each article engaging member has a number of recessed pockets each for an article and also each article engaging member is removably attached to its associated carriage.

5. A mechanism as claimed in claim 4 wherein the carriages are pivotally attachable at any location along the length of the drive which is preferably a chain.
6. A mechanism as claimed in claim 5 wherein the carriages are equispaced along the length of the chain.
7. A mechanism as claimed in any one of claims 1 to 6 wherein the guide tracks are offset such that the straight sections are offset in both lateral and lengthwise directions.
8. A mechanism as claimed in any one of claims 1 to 7 wherein the guide tracks are formed as grooves in a plastics member disposed above the single chain.
9. A mechanism as claimed in claim 8 wherein the guide tracks are superimposed on each other and cross each other at two locations.
10. A spacing conveyor arrangement comprising two spacing conveyor mechanisms as claimed in any one of claims 1 to 10, disposed parallel to each other on each side of an article feed path or paths.

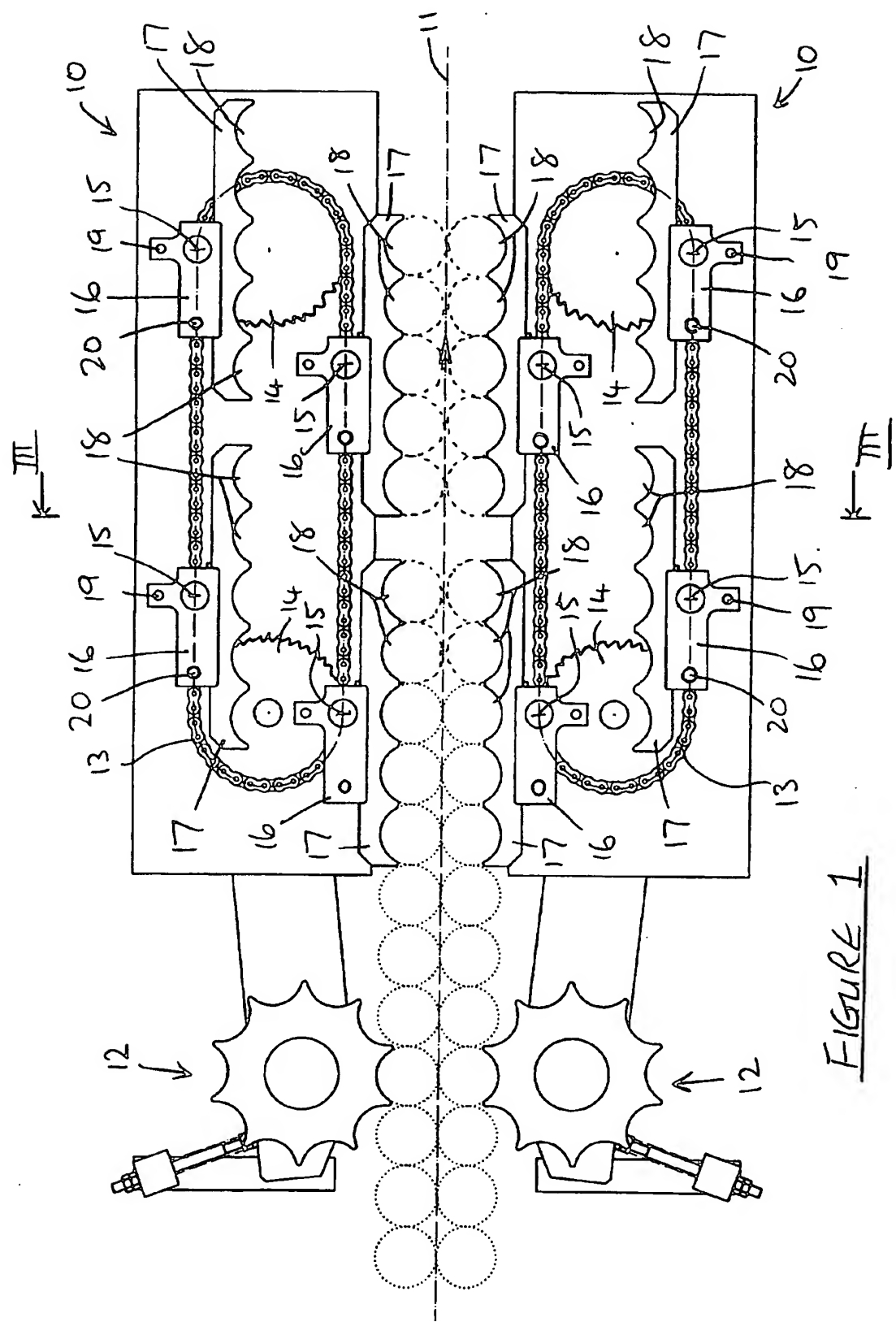


FIGURE 1

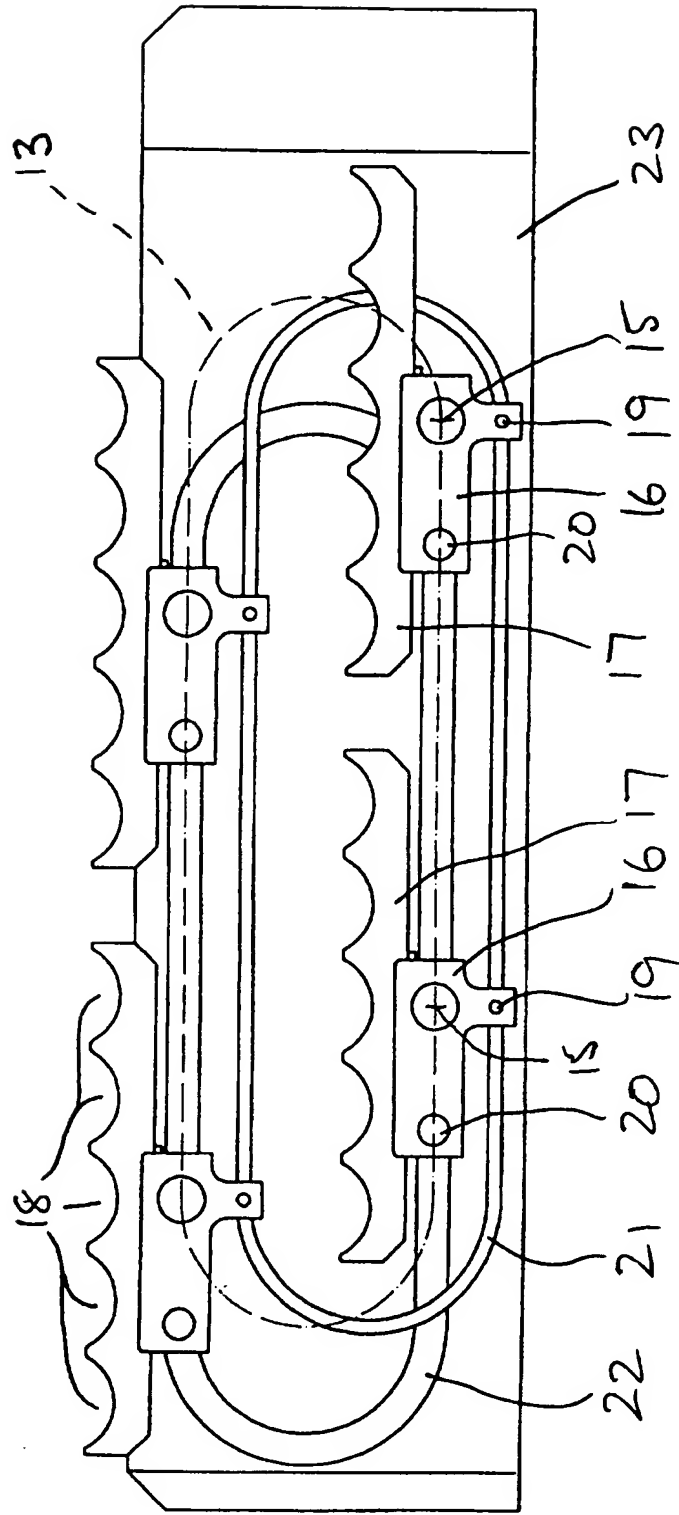


FIGURE 2

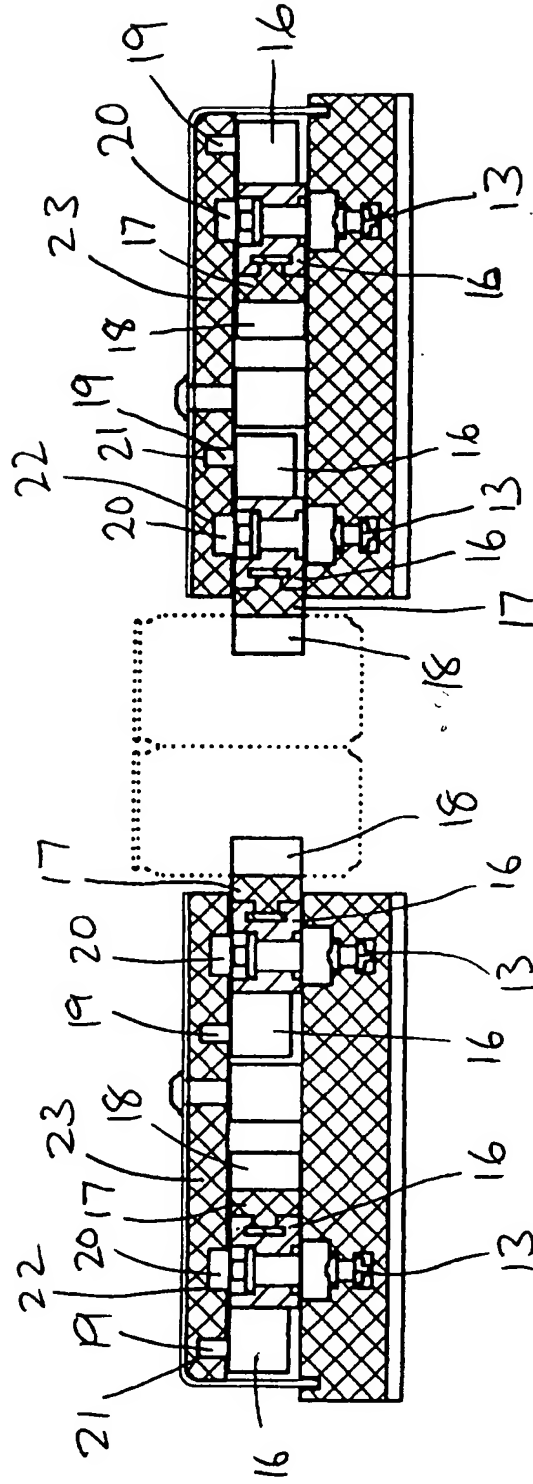


FIGURE 3



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 95 30 7257

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	EP-A-0 450 915 (MEAD CORPORATION) 9 October 1991 * claim 1; figures 1-3 * ---	1-6, 10	B65B21/06 B65G37/00 B65G47/08
Y	FR-A-2 701 695 (J. FONTAINE) 26 August 1994 * claim 1; figures 1-3 * ---	1-6, 10	
A	DE-A-25 56 337 (RAHDENER MASCHINENFABRIK A. KOLBUS) 23 June 1977 * figure 1 * -----	7	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65B B65G
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 8 February 1996	Examiner Grentzius, W
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